

**RIOT ZONE (PWS 7260073)**  
**SOURCE WATER ASSESSMENT FINAL REPORT**

---

**June 25, 2004**



**State of Idaho**  
**Department of Environmental Quality**

**Disclaimer:** This publication has been developed as part of an informational service for the source water assessments of public water systems in Idaho and is based on the data available at the time and the professional judgement of the staff. Although reasonable efforts have been made to present accurate information, no guarantees, including expressed or implied warranties of any kind, are made with respect to this publication by the State of Idaho or any of its agencies, employees, or agents, who also assume no legal responsibility for the accuracy of presentations, comments, or other information in this publication. The assessment is subject to modification if new data is produced.

## Executive Summary

Under the Federal Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. The Idaho Department of Environmental Quality (DEQ) is completing the assessments for all Idaho public drinking water systems. The assessment for the Riot Zone drinking water source is based on a land use inventory within a 1,000-foot radius of the well source, sensitivity factors associated with the source, and characteristics associated with either your aquifer or watershed in which you live.

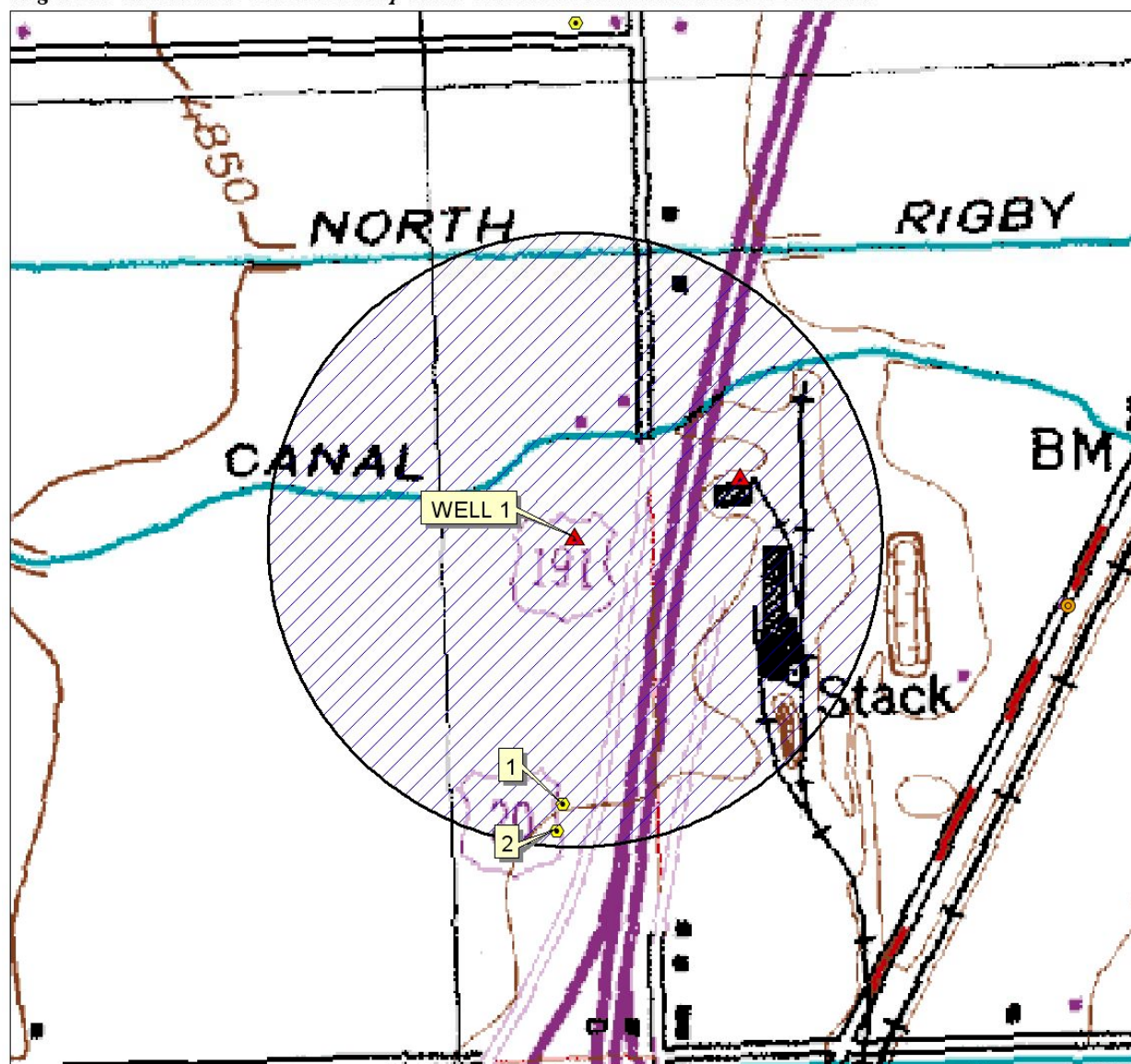
This report, Source Water Assessment for Riot Zone (PWS # 7260073) describes the public drinking water system, the associated potential contaminant sources located within a 1,000-foot boundary around the drinking water source, and the susceptibility that may be associated with any associated potential contaminants. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this system. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the Riot Zone water system.**

The Riot Zone is located north of Rigby, along Highway 28, in Jefferson County (see Figure 1). The non-community transient water system has one well that serves the business. Water quality tests conducted for the well do not show detections of total coliform bacteria from April 2002 through December 2003. However, there have been detections of nitrate within the sampled well water, though the levels are well below the above maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) as set by the EPA.

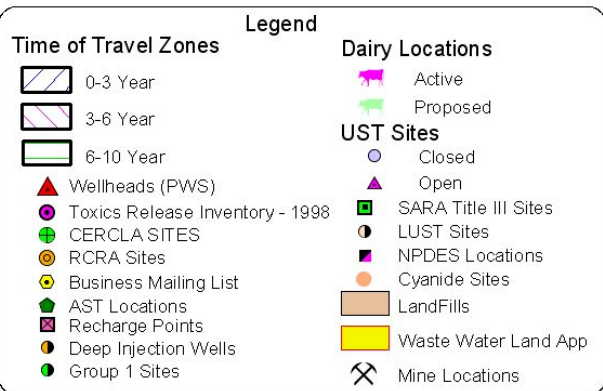
Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The final susceptibility ranking for the well is high for IOCs and SOCs, predominantly due to the agricultural land uses within the delineation boundaries. The moderate system construction, hydrologic sensitivity, and contaminant inventory result in an overall moderate susceptibility for VOCs (see Table 2). Sources within 50 feet of the wellhead can give an automatic high score for the type of contaminant in question. The August 2002 GWUDI field survey shows a canal within 50 feet of the well, leading to an automatic high rating for microbial contamination. A copy of the susceptibility analysis for the Riot Zone well along with a map showing potential contaminant sources are included with this summary. Information regarding the potential contaminants within the 1,000-foot boundary have been summarized and included in Table 1.

Figure 2. Riot Zone Delineation Map and Potential Contaminant Source Locations



0 0.5 1 Miles



**PWS# 7260073**  
**WELL 1**

## Potential Contamination

The potential contaminant sources identified within the delineated area include Highway 28, the railroad, a welding shop, and a tractor dealer (see Table 1 and Figure 2). If an accidental spill occurred on these transportation corridors IOC's (e.g. nitrate), VOCs (e.g. petroleum products), SOC's (e.g. pesticides), and microbial contaminants (e.g. bacteria) could be added to the ground water.

**Table 1. Riot Zone Potential Contaminant Inventory**

Map ID	Source Description	Source of Information	Potential Contaminants <sup>1</sup>
1	Welding	Database Search	IOC, VOC, SOC
2	Tractor Dealer	Database Search	IOC, VOC, SOC
	Highway 28	GIS Map	IOC, VOC, SOC, M
	Railroad	GIS Map	IOC, VOC, SOC, M

<sup>1</sup>IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical, M= microbial

## Susceptibility Analysis

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix A contains the susceptibility analysis worksheet. The following summaries describe the rationale for the susceptibility ranking.

The hydrologic sensitivity was rated moderate for the well. This rating is based upon multiple factors. The soils rate as poor- to moderately-drained as defined by the Natural Resource Conservation Service. The well log describes the vadose zone as being composed of 30 feet below ground surface (bgs) of gravel until the water table is reached. There are no low permeability units identified in the well log to reduce the downward flux of contaminants. To reduce the hydrologic sensitivity score, the SWA Plan (DEQ, 1999) identifies deep ground water, at greater than or equal to 300 feet bgs, as a contributing factor. That is not the case for this well.

The well's system construction score was rated moderate. The well was drilled in December of 2000 to a depth of 78 feet bgs. The static water level at the time of drilling was 30 feet bgs. The well has a 0.250-inch thick, 6-inch diameter casing from the 2 feet above ground surface to 78 feet bgs into gravel, which is not a confining layer as required by DEQ (1999) to achieve a lower score. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. Standard 3.2.4.1 requires all PWSs to have yield and drawdown tests that last "24 hours or until stabilized drawdown has continued for six hours at 1.5 times" the design pumping rate (IDEQ, 1997). The casing has no listed perforations

or screens. The SWA Plan (DEQ, 1999) identifies that having 100 feet of water column before screening provides a buffering capacity to infiltrating contaminants. According to the 2002 sanitary survey the sanitary seal is in good condition and the well is protected from surface flooding. The 2002 sanitary survey noted that the well is not located within a well house.

The Riot Zone Well rated high (Table 2) for potential contaminant sources and land use for IOCs (e.g., nitrates) and SOC (e.g. pesticides), and moderate for VOCs (e.g., petroleum products) and microbial contamination (e.g., total coliform). The railroad and Highway 28 added to the rankings all types of contamination. In addition, the land use survey identified that the delineation crosses an organics priority area for the pesticide atrazine. Also, the overall land use was dominated by irrigated agricultural land.

The final susceptibility ranking for the well is high for IOCs and SOC, predominantly due to the agricultural land uses within the delineation boundaries. The moderate system construction, hydrologic sensitivity, and contaminant inventory result in an overall moderate susceptibility for VOCs (see Table 2). Sources within 50 feet of the wellhead can give an automatic high score for the type of contaminant in question. The August 2002 GWUDI field survey shows a canal within 50 feet of the well, leading to an automatic high rating for microbial contamination. If this canal can be altered to flow greater than 50 feet from the well, then the microbial rating would be reduced to moderate. A copy of the susceptibility analysis for the Riot Zone well along with a map showing potential contaminant sources are included with this summary. Information regarding the potential contaminants within the 1,000-foot boundary have been summarized and included in Table 1.

**Table 2. Summary of Riot Zone Stores Susceptibility Evaluation**

	Susceptibility Scores <sup>1</sup>									
	Hydrologic Sensitivity	Contaminant Inventory <sup>2</sup>				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbial		IOC	VOC	SOC	Microbial
Well	M	H	M	H	M	M	H	M	H	H*

<sup>1</sup>H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility

<sup>2</sup>IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical, M= microbial

H\* = automatic high rating due to canal within 50 feet of wellhead

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

## **Protection Activities**

For the Riot Zone water system, drinking water protection activities should focus on maintaining the requirements of the sanitary survey. Protecting the well from unauthorized access would be an appropriate first step. The water system operator may consider installing a locking fence around the wellhead to restrict direct access. No chemicals should be stored or applied within 50 feet of the well. The location of the canal within 50 feet of the well provides a conduit for chemicals to come very close to the well and influence the shallow water table. Any releases on the highway or the railroad within the delineation boundary should be evaluated and the drinking water should be evaluated following such a release. Working with the local soil and conservation district and Jefferson County will better inform the water system operator of chemicals that may be applied or stored near the drinking water well. The water system operator is also encouraged to develop a drinking water protection plan to document and rank potential contaminant sources, assess protection efforts, and provide education for staff and the public about the drinking water.

Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

## **Assistance**

A water system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact Jack Rainey in the Idaho Department of Environmental Quality Idaho Falls Regional Office at (208) 528-2650.

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper, Idaho Rural Water Association, at 208-343-7001 ([mlharper@idahoruralwater.com](mailto:mlharper@idahoruralwater.com)) for assistance with drinking water protection (formerly wellhead protection) strategies.

## POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few heads to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of storm water runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100-year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RCRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory

## **References Cited**

Idaho Department of Environmental Quality, 1999. Source Water Assessment Plan.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.



The final scores for the **Riot Zone** susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.27)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- > 13 High Susceptibility

1. System Construction		SCORE			
Drill Date	December 7, 2000				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2002			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain and protected from surface flooding	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	YES	0			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		4			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED AGRICULTURE	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	4	4	4	2
(Score = # Sources X 2 ) 8 Points Maximum		8	8	8	4
Sources of Class II or III leacheable contaminants or 4 Points Maximum	YES	6	2	2	
Zone 1B contains or intercepts a Group 1 Area	YES	4	2	2	
Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		0	0	2	0
		4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	14	16	8
Cumulative Potential Contaminant / Land Use Score		18	16	18	10
Weighted Potential Contaminant / Land Use Score		5	4	5	4
4. Final Susceptibility Source Score		13	12	13	12
5. Final Well Ranking		High	Moderate	High	Moderate